LLŶR FLOATING OFFSHORE WIND PROJECT

Llŷr 1 Floating Offshore Wind Farm

Environmental Statement

Volume 6: Appendix 4B, Invasive Non-Native Species (INNS) Management Plan

August 2024

Prepared by: Llŷr Floating Wind Ltd

FLOVENTIS ENERGY

Document Status

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Acronyms and abbreviations

Acronym or Abbreviation	Definition	Acronym or Abbreviation	Definition
DDV	Drop-down Video	INNS	Invasive Non-Native Species
OfECC	Export Cable Corridor	MCAA	Marine and Coastal Access Act
ES	Environmental Statement	MW	Megawatts
FLOW	Floating Offshore Wind	NRW	Natural Resources Wales
IMO	International Maritime Organisation	WTG	Wind Turbine Generator

Glossary of project terms

Term	Definition
The Applicant	The developer of the Project, Llŷr Floating Wind Limited
Array	All wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure within the Array Area, as defined, when considered collectively, excluding the offshore export cable(s).
Array Area	The area within which the wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure will be located
Floventis Energy	A joint venture company between Cierco Ltd and SBM Offshore Ltd of which Llŷr Floating Wind Limited is a wholly owned subsidiary.
Landfall	The location where the offshore export cable(s) from the Array Area, as defined, are brought onshore and connected to the onshore export cables (as defined) via the transition joint bays (TJB).
Llŷr 1	The proposed Project, for which the Applicant is applying for Section 36 and Marine Licence consents. Including all offshore and onshore infrastructure and activities, and all project phases.
Marine Licence	A licence required under the Marine and Coastal Access Act 2009 for marine works which is administered by Natural Resources Wales (NRW) Marine Licensing Team (MLT) on behalf of the Welsh Ministers.
Offshore Development Area	The footprint of the offshore infrastructure and associated temporary works, comprised of the Array Area and the Offshore Export Cable Corridor, as defined, that forms the offshore boundary for the S36 Consent and Marine Licence application
Offshore Export Cable	The cable(s) that transmit electricity produced by the WTGs to landfall.
Offshore Export Cable Corridor (OfECC)	The area within which the offshore export cable circuit(s) will be located, from the Array Area to the Landfall.
Onshore Development Area	The footprint of the onshore infrastructure and associated temporary works, comprised of the Onshore Export Cable Corridor and the Onshore Substation, as defined, and including new access routes and visibility splays, that forms the onshore boundary for the planning application.
Onshore Export Cable(s)	The cable(s) that transmit electricity from the landfall to the onshore substation

Term	Definition
Onshore Export Cable Corridor (OnECC)	The area within which the onshore export cable circuit(s) will be located.
proposed Project	All aspects of the Llŷr 1 development (i.e. the onshore and offshore components).
Onshore Substation	Located within the Onshore Development Area, converts high voltage generated electricity into low voltage electricity that can be used for the grid and domestic consumption.
Section 36 consent	Consent to construct and operate an offshore generating station, under Section 36 (S.36) of the Electricity Act 1989. This includes deemed planning permission for onshore works.

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4-B INVASIVE NON-NATIVE SPECIES PLAN

4.1 Introduction

1. This marine Invasive Non-Native Species (INNS) management plan forms part of the Environmental Statement (ES) for the Llŷr 1 Floating Offshore Wind (FLOW) project (hereafter referred to as the 'proposed Project') on behalf of Llŷr Floating Wind Limited (hereafter referred to as the Applicant). This assessment fulfils the requirement for a Biodiversity Risk Assessment and Management Plan as outlined by Natural Resources Wales (NRW) and supports Marine Licensing Applications and Section 36 consent for the proposed Project to the NRW Marine Licensing Team under the Marine and Coastal Access Act 2009 (MCAA). This plan has been prepared in line with NRW guidance (Cook et al., 2015; NRW, 2023), and is one of several plans that form the Construction (CEMP) and Project Environmental Management Plans (PEMP).
2. The Applicant is proposing to develop the Llŷr 1 FLOW, located approximately 35 km off the coast of Pembrokeshire in the Celtic Sea.
3. The proposed Project is a test and demonstration wind farm development, comprising up to 10 wind turbine generators (WTGs). The proposed Project will make landfall at Freshwater West before connecting into Pembroke Dock power station and the National Grid network.
4. The Applicant is seeking a Section 36 consent with deemed planning permission under the Electricity Act 1989 and Marine Licence under Part 4 of the Marine and Coastal Access Act 2009 for Llŷr 1, and this document supports the Environmental Statement (ES) which is submitted in support of those consent applications. This document describes the potential risks of marine INNS introduction associated with the proposed Project and provides a framework for preventing their introduction and spread during the construction, operation and maintenance and decommissioning phases. It includes relevant biosecurity control measures and best practice measures to reduce the risk of INNS introduction from the proposed Project.
5. This appendix should be read in conjunction with the following linked and supporting chapters:

   - **Chapter 04: Description of the Proposed Project** - provides further details of the project design parameters;
   - **Chapter 02: Legislation Policy and Guidance** – provides further information regarding relevant legislation and policy associated with the proposed Project;
   - **Chapter 17: Physical Environment** – details local environmental conditions;
   - **Chapter 19: Benthic Ecology** – details local marine ecological considerations; and,
   - **Chapter 24: Marine Archaeology** – provides further information regarding the presence of other structures requiring considering in this assessment.

4.2 Legislation, Policy, and Guidance

6. The following sections identify specific legislation, policy and guidance that is applicable to the assessment of marine INNS introduction. Further detail on the wider legislation, policy and guidance relevant to the ES is provided in **Chapter 02: Regulatory and Planning Policy Context**

4.2.1. Legislation

7. The legislation that is applicable to this management plan is summarised below.

   - The Wildlife and Countryside Act 1981 (HM Government, 1981);

- Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive);
- Marine and Coastal Access Act 2009 (as amended) (HM Government, 2009);
- The Marine Strategy Regulations 2010 (HM Government, 2010);
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (HM Government, 2017);
- EU Regulation 1143/2014 was retained in domestic law under the European Union (Withdrawal) Act 2018 (HM Government, 2018);
- The Invasive Alien Species (Enforcement and Permitting) Order 2019 (HM Government, 2019a);
- The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (HM Government, 2019b).

4.2.2. Policy

8. The following local and regional policies have been considered as part of this INNS plan:

- **UK Marine Policy Statement,** which aims to achieve sustainable development in the UK marine area;
- **Welsh National Marine Plan,** which sets out a single framework for sustainable development within Wales marine area, including the requirement to maintain seafloor integrity and safeguard benthic ecosystems;
- **The Great Britain Invasive Non-native Species Strategy,** sets out aims and actions for addressing threats posed by INNS;
- **Planning Policy Wales,** highlights the importance of biodiversity for natural services, sustainability and the Welsh economy. It includes objectives to achieve efficient use and protection of natural resources and enhancing biodiversity;
- **Nature Recovery Action Plan Wales,** a strategy for Wales which aims to address declining biodiversity, including marine habitats, ecosystems and fisheries;
- **Pembrokeshire Coast National Park Development Plan,** which sets out policies for local developments in Pembrokeshire to determine the outcome of planning applications; and
- **South West Wales Area Statement,** which identifies the key risks, opportunities and priorities needed to build the resilience of our ecosystems and support sustainable management of the natural resources.

4.2.3. Guidance

9. In addition to the legislation and policies outlined above, the following guidance was also applicable for the preparation of this INNS management plan:

- Marine Biosecurity Planning Guidance for producing site and operation-based plans for preventing the introduction and spread of invasive non-native species in England and Wales (Cook et al., 2015);
- RAPID Life Project Marine biosecurity toolkit and guidance documents; and
- GB Non-Native Species Secretariat marine biosecurity guidance.

4.3 The Study Area

10. The proposed Project is in the north-east Celtic Sea, with the export cable landfall located at Freshwater West, approximately 4 km from the entrance to Milford Haven. The components of the proposed Project include the offshore Array Area comprising the floating turbines and the inter-array cables, the offshore export cable corridor (OfECC) and cable landfall area.

11. The Study Area takes a precautionary approach to ensure the assessment incorporates all areas which could contribute to INNS introduction and spread throughout the life cycle of the proposed Project. This area includes the tidal range around Milford Haven, which overlaps with nearshore elements of the project, as well as the tidal excursion distance on a mean tide for the offshore elements, which is considered to represent the greatest distance travelled of any INNS larvae carried in suspension. The tidal excursion distance on a mean tide associated with Milford Haven waterway is 14 km in the nearshore and up to 8 km in the offshore environment (see **Chapter 17: Physical Environment**).

12. The location of the Study Area in relation to the proposed Project, with predicted benthic habitats is provided in **Figure 4B-1.**

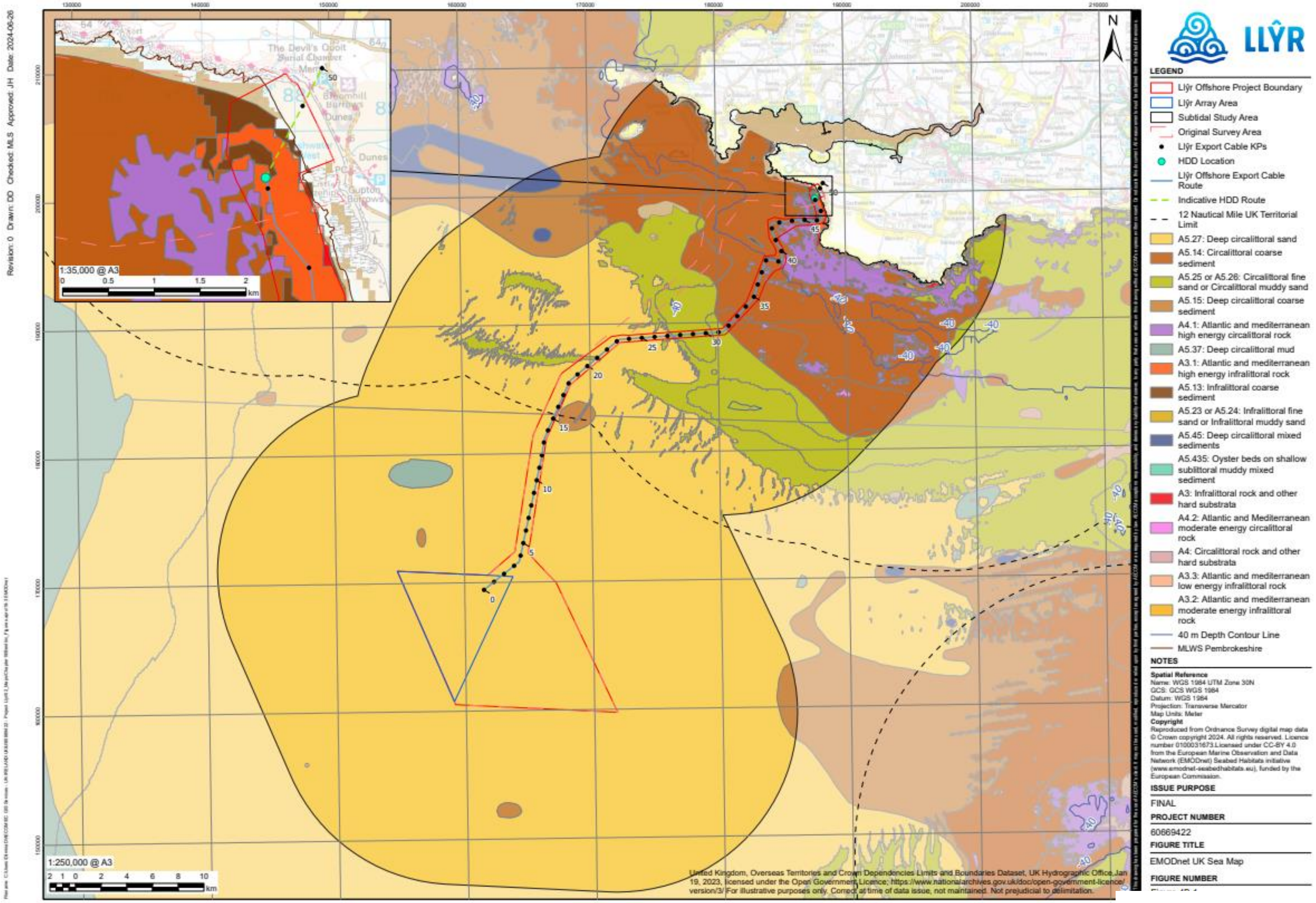

Figure 4B-1. Llŷr Floating Offshore Wind Project location

4.4 Environmental Conditions

13. Local environmental conditions are an important factor in the spread of marine INNS, as they are the key to whether introduced species can survive and establish themselves. Ideal conditions can vary by species and as such, understanding the local environmental conditions relevant to the proposed Project and available habitats will provide a better indication of which species are likely to establish if introduced.

14. The Array Area is comprised of primarily sandy substrate, with a moderate percentage of gravel and a largely featureless surface. Along the OfECC, the benthos is primarily sandy habitat in the nearshore by the landfall location, before transitioning to sandy habitat with large patches of circalittoral rock in slightly deeper waters, with some areas qualifying as rocky and stony reefs. The offshore habitat of the OfECCOFECC largely consists of sandy sediments, with small patches of bedrock reef, mud, and an area of sandbanks. (see **Chapter 19: Benthic Ecology**).

15. The Array Area is representative of a fully marine environment, with a salinity values from a nearby development reported as approximately 35 psu (MarineSpace Ltd., 2021). The nearshore environment has exhibited some variation, but lacks large freshwater inputs, with salinity values ranging from 34.2 to 34.4 psu (MarineSpace Ltd., 2021).

16. Tidal movements may also serve as an important vector for transporting marine INNS, as local water currents may carry pelagic species and/or larvae to new sites. Potential distances that INNS may travel can be represented by maximum tidal excursion distances. Project-specific hydrodynamic modelling indicates that tidal excursion distances during a mean tide may be up to 8 km in the offshore Array Area, up to 10 km in the middle of the OfECC, and 14 km in the nearshore on approach to the landfall (see **Chapter 17: Physical Environment; Figure 4B-1**). The habitats observed within the Array Area, OfECC, and nearshore are also considered representative of the wider Study Area, which accounts for these excursion distances.

17. Current speeds (see **Chapter 17: Physical Environment**) on a mean spring tide in the Array Area is approximately 0.6 to 0.8 m/s. Peak current speeds gradually increase along the OfECC to approximately 1.0 to 1.4 m/s in the nearshore approaches to Milford Haven, due to regional scale flow acceleration around the Pembrokeshire peninsula. Within Milford Haven Estuary (which is close by to, but does not overlap with the proposed Project), current speeds decrease to between 0.4 to 0.6 m/s. In the more locally sheltered landfall location near Freshwater West (where water depths are <10 m lowest astronomical tide), the peak current speed can be significantly lower, in the order of 0.1 to 0.2 m/s.

18. Tidal currents (see **Chapter 17: Physical Environment**) are directed towards the east or east-south-east at the peak of the flood tide and reverse at the peak of the ebb in the Array Area; at times of less than peak current speed, the direction of currents rotates gradually and continuously throughout the tidal cycle, resulting in limited to no completely slack water condition. Elsewhere along the OfECC, the axis of peak tidal currents is closer to south-east / north-west offshore, becoming progressively more aligned to the local coastline and becoming more rectilinear (less rotational) in nearshore areas.

4.4.1. Anthropogenic Structures

19. Anthropogenic activities are a major component in the introduction of marine INNS. In particular, artificial structures introduced into the marine environment (e.g. breakwaters, artificial reefs, mooring blocks, cable protection measures) are known to exhibit significantly different community compositions compared to natural substrates (Mineur et al., 2012). In some instances, these structures are known to favour colonisation by range-shifting species

and act as either a stepping stone or as a direct vector for their dispersal (Mineur et al., 2012). Infrastructure associated with offshore windfarms especially have been observed supporting assemblages of marine INNS in the North Sea and eastern United States (Rumes and Kerckhof, 2021), with the colonisation by marine INNS considered one of the primary ecological risks associated with offshore windfarm development (Bennun et al., 2021).

20. The proposed Project is anticipated to introduce up to 10 floating turbines across an area of 45 km^2, each of which will be associated with components that may serve as suitable habitat for marine INNS (see **Chapter 04: Description of the Proposed Project**). Each turbine will be mounted to a floating concrete or steel substructure and moored with a system comprising of mooring lines (maximum length 1,250 m each), anchors, and ancillary components. The mooring and anchorage designs have yet to be finalised, however, current options being considered include up to 80 total mooring lines and anchors. Additionally, the proposed export cables may comprise up to two 49 km cables. The offshore export cables will be buried wherever possible, however where the minimum depth of cover is not achievable, cable protection may be required. It is anticipated that up to 4.9% or 2,400 m of each cable will require additional cable protection measures, which includes 200 of protection at each of four crossings. Additionally in the nearshore area between KP42 and KP48, up to 12.7% or 6,200 m of each cable will be protected using iron articulated pipe protection.

21. Several existing anthropogenic structures are also present within the Study Area. Six subsea fibre-optic cables cross the Study Area (Verweerd, 2022), as well as numerous shipwrecks, although only two were confirmed as live (see **Chapter 24: Marine Archaeology**). Additionally, other developments near the proposed Project may result in further anthropogenic structures introduced to the Study Area. The new wave energy site South Pembrokeshire Demonstration Zone off South Pembrokeshire may support a 90 km^2 area of demonstration wave arrays and include a 400 kV transmission line to the mainland. An additional offshore windfarm array has been proposed near the proposed Project (Erebus), which may include up to 0.37 km^2 of hard substrate, comprising floating platforms, anchors, piles mooring lines, export cables, and/or cable protection.

22. Further details on the components of the proposed Project including number of components and submerged surface area are provided in **Chapter 04: Description of the Proposed Project**.

4.4.2. INNS Already Present in the Region

23. In Wales, a list of priority marine INNS has been developed by the Welsh government (Welsh Government, 2018) with each species ranked according to the risk analysis conducted by the GB Non-Native Species Secretariat. This analysis includes an assessment of over 100 non-native species as well as information about horizon scanning (new non-native species) and risk management to provide a structured, science-based approach to providing rationale for management measures. The results of this analysis are provided in **Table 4B-1.**

Table 4B-1. INNS species of Wales and associated risk assessment scores

Scientific Name	Common Name	Likelihood of Presence within Study Area	Risk Assessment score (Welsh Government, 2018)	Description
Grateloupia turuturu	Devil's tongue weed	Unlikely	Very High	Present throughout Milford Haven and Pembrokeshire waters (Jennings and Wray 2014). Primarily occurs in sheltered areas such as harbours and bays, attached to artificial substrates, lower shore pools, and subtidally to 7 m (GB-NNSS, 2011).
Asterocarpa humilis	Compass Sea Squirt	Unlikely	High	Documented within Holyhead and Milford Haven (Tillin et al., 2020) Typically found in harbours and marinas, fouling hulls, pontoons, and buoys (Morrow 2020).
Crepidula fornicata	Slipper limpet	Unlikely	High	Well established in Milford Haven (Bohn et al., 2015; OEL, 2021), also considered widely established and south and southwest Wales (Tillin et al., 2020). Typically inhabit shallow, sheltered bays, lagoons, estuaries, and sheltered sides of islands on a variety of substrates (Tillin et al., 2020).
Didemnum vexillum	Carpet sea squirt	Unlikely	High	Observed primarily in the Holyhead area (Tillin et al., 2020). Typically found growing on artificial substrata, usually in sheltered areas, from the low shore down to 65 m (Morrow 2020).
Eriocheir sinensis	Chinese mitten crab	Unlikely	High	Established population in the River Dee in North Wales with isolated records from Swansea Bay and the English side of the Severn Estuary (Tillin et al., 2020). Juveniles occur within the marine environment, with a preference for sheltered bays and estuaries (Tillin et al., 2020), before moving into brackish and freshwater (Morrow 2020).
Watersipora subatra	Red ripple bryozoan	Likely	High	Known to be present in Milford Haven and in Pembrokeshire waters (Wilson, 2017; Tillin et al., 2020). Typically found along artificial substrata in marinas and

Scientific Name	Common Name	Likelihood of Presence within Study Area	Risk Assessment score (Welsh Government, 2018)	Description
				harbours as well as along rocks and shells in the shallow subtidal (Wilson, 2017; Morrow 2020). It is now also frequently being recorded on natural shores on a wide range of substrata and is believed to be the predominant species of this genus found in the UK (Wilson, 2017; GB-NNSS 2011).
Bonnemaisonia hamifera	Bonnemaison's hook weed	Unlikely	Moderate	Considered widely distributed on the southern and western coasts of Britain (Tillin et al., 2020). Found in rock pools along the lower intertidal and in the shallow subtidal, growing predominantly as an epiphyte on other algae (Morrow 2020).
Diadumene lineata	Orange striped anemone	Unlikely	Moderate	Sporadically reported from Cardiff, Milford Haven, Abereiddy, and Anglesey (Tillin et al., 2020). Found primarily attached to hard substrates in brackish, sheltered waters (Tillin et al., 2020).
Ensis leei	American jack knife clam	Possible	Moderate	Known to be present in Milford Haven (Tillin et al., 2020). Burrows in in a range of soft sediments from coarse sediments to muddy sediments and silt (Tillin et al., 2020). Seemingly prefers estuarine conditions in the lower shore and shallow subtidal, with a preference for areas with moderately high bed shear stress (Tillin et al., 2020).
Ficopomatus enigmaticus	Coral worm	Unlikely	Moderate	Distributed along the southern coasts of England and Wales, primarily in brackish waters in ports, estuaries and lagoons, attached to rocks, shells, and other hard substrata in the lower intertidal and shallow subtidal (GB-NNSS, 2011).

Scientific Name	Common Name	Likelihood of Presence within Study Area	Risk Assessment score (Welsh Government, 2018)	Description
Schizoporella japonica	Orange ripple bryozoan	Unlikely	Moderate	Predominantly found in marinas and harbours along infrastructure and pontoons; occurrence in natural habitats has yet to be reported in Great Britain (GB-NNSS, 2011).
Styela clava	Leathery sea squirt	Possible	Moderate	Recorded along the south coast of England and along the Pembrokeshire coast (Neish, 2007). Typically found attached to hard substrata in shallow water, primarily in harbours and marinas, but also on natural rock bottoms (GB-NNSS, 2011).
Undaria pinnatifida	Wakame	Unlikely	Moderate	Found in the low intertidal and subtidal areas on manmade structures, but may also occur on loose cobbles and shells (GB-NNSS, 2011).
Caprella mutica	Japanese skeleton shrimp	Unlikely	Medium	Observed primarily in the Holyhead region (Tillin et al., 2020). Typically attached to algae and sessile animals, particularly within harbours and marinas (Morrow 2020).
Crassostrea gigas	Pacific oyster	Possible	Medium	Known settlement within Milford Haven and predicted to be throughout the Pembrokeshire coast (Robins et al., 2017; Tillin et al., 2020). Found on the lower shore and shallow sublittoral to 80 m depth (Morrow 2020) on rock, concrete artificial structures, shells or stones, as well as within intertidal mudflats, sandflats, intertidal biogenic reef and intertidal rock (Tillin et al., 2020)

Scientific Name	Common Name	Likelihood of Presence within Study Area	Risk Assessment score (Welsh Government, 2018)	Description
Sargassum muticum	Japanese wireweed	Likely	Medium	Occurs widely on the coast across a range of exposures, but is most successful in sheltered areas. It grows on hard surfaces both intertidally and subtidally, although it can also detach and float freely out at sea.
Asparagopsis armata	Harpoon weed	Possible	Low/unknown risk	Observed primarily around the southwestern English coast, with a few observations around the western Pembrokeshire coast, primarily around St. Bride's Bay (Skewes, 2003). Typically found in lower intertidal and shallow subtidal in sheltered or moderately exposed areas (Morrow 2020).
Aplidium cf. *glabrum*	Glassy sea squirt	Unlikely	Low/unknown risk	Often on artificial substrata in marinas and harbours but also beneath boulders on the low shore in sheltered, silty areas (Morrow 2020).
Amphibalanus improvisus	Barnacle	Unlikely	Low/unknown risk	Most commonly found subtidally from the lower shore in estuaries on stony, rocky, and hard bottom substrates to depths of around 50 metres (GB-NNSS, 2011).
Anotrichium furcellatum	Red alga	Possible	Low/unknown risk	Recorded within Milford Haven (GBIF Secretariat, 2023)
Antithamnionella spirographidis	Red alga	Possible	Low/unknown risk	Recorded within Milford Haven (GBIF Secretariat, 2023)
Antithamnionella ternifolia	Red alga	Possible	Low/unknown risk	Recorded within Milford Haven and along the South Pembrokeshire coast (GBIF Secretariat, 2023)
Austrominius modestus	Modest barnacle	Unlikely	Low/unknown risk	Widespread throughout England and Wales (Avant, 2007). Occurs in a wide range of intertidal habitats, including on rocks and shells and fouling other organisms (Morrow 2020).

Scientific Name	Common Name	Likelihood of Presence within Study Area	Risk Assessment score (Welsh Government, 2018)	Description
Botrylloides c.f. diegensis	Sea squirt	Unlikely	Low/unknown risk	Primarily present along southern English coast (GBIF Secretariat, 2023). Typically occurs in harbours and marinas attached to artificial structures (GB-NNSS, 2011).
Botrylloides violaceus	Orange sheath tunicate	Possible	Low/unknown risk	Observed primarily in southern UK, including Milford Haven (Snowden, 2008). Primarily found in harbours and marinas and sheltered natural shores, growing on artificial and solid natural substrata, as well aso on algae, mussels and other sea squirts (GB-NNSS, 2011; Morrow 2020).
Bugula neritina	Bryozoan	Unlikely	Low/unknown risk	Recorded primarily along the southern UK coast, including Milford Haven and Pembrokeshire coast (GBIF Secretariat, 2023). Found primarily in protected sites such as marinas and harbours on kelp and artificial substrata (GB-NNSS, 2011; Morrow 2020).
Bugula simplex	Bryozoan	Unlikely	Low/unknown risk	Found in marinas and harbours on artificial substrata (Morrow 2020).
Bugula stolonifera	Bryozoan	Unlikely	Low/unknown risk	Primarily observed on artificial structures in harbours and marinas (Fofonoff et al., 2018)
Codium fragile	Dead man's fingers	Likely	Low/unknown risk	Reported widely throughout the UK, including the Pembrokeshire coast (GBIF Secretariat, 2023). Attaches to hard substrates in a wide range of habitats, including rocky and cobble shores, seagrass beds, oyster reefs, and artificial structures (Fofonoff et al., 2018).
Colpomenia peregrina	Blader weed	Unlikely	Low/unknown risk	Widespread throughout the UK, including Pembrokeshire and Milford Haven (GBIF Secretariat, 2023). Found in intertidal rock pools and the shallow subtidal, usually growing on other algae as well as shells (Morrow 2020).

Scientific Name	Common Name	Likelihood of Presence within Study Area	Risk Assessment score (Welsh Government, 2018)	Description
Corella eumyota	Orange tipped sea squirt	Unlikely	Low/unknown risk	Recorded within Milford Haven (NBN Atlas, 2024). Often on artificial substrata in marinas and harbours or attached to cobbles, boulders, shells and stones on the low shore in sheltered areas (Bilewitch, 2009; Morrow 2020).
Monocorophium sextonae	Mud shrimp	Possible	Low/unknown risk	Recorded within Milford Haven and the western Pembrokeshire coast (GBIF Secretariat, 2023). Found in subtidal habitats up to 50 m attached to rocks, artificial substrata, and other benthic invertebrates (Hill et al., 2005; GB-NNSS, 2011).
Feldmannophycus okamurae	Red alga	Unlikely	Low/unknown risk	Recorded within Milford Haven (GBIF Secretariat, 2023)). Often observed on intertidal rocky exposed shores attached to hard substrates (Cefas, 2020).
Goniadella gracilis	Polychaete	Possible	Low/unknown risk	Primarily recorded offshore the western UK coast (GBIF Secretariat, 2023); associated benthic habitat similar to Study Area (EMODnet, 2023)
Mya arenaria	Soft shell clam	Likely	Low/unknown risk	Widespread throughout the UK on all coasts (Tyler-Walters, 2003). Inhabits gravelly to muddy bottoms, from the mid-intertidal to about 100 m depth, although they rarely occur below 9-10 m (Fofonoff et al., 2018).
Mytilicola intestinalis	Mussel red worm	Possible	Low/unknown risk	Recorded within Milford Haven (GBIF Secretariat, 2023). Inhabits intestinal tracts of molluscs Bower 2009).
Mytilopsis leucophaeata	Bivalve	Possible	Low/unknown risk	Observed sporadically along southern Pembrokeshire coastline, but not within or near the Study Area (GBIF Secretariat, 2023). Typically found in brackish environments but can tolerate a wide range of salinities; often found growing on hard surfaces (Fofonoff et al., 2018).

Scientific Name	Common Name	Likelihood of Presence within Study Area	Risk Assessment score (Welsh Government, 2018)	Description
Mytilus galloprovincialis	Mussel	Possible	Low/unknown risk	Occur on a variety of intertidal and shallow subtidal surfaces, including rock, wood, vegetation, docks and boat hulls (Fofonoff et al., 2018).
Ostrea chilensis	Bivalve	Unlikely	Low/unknown risk	Observed primarily on Anglesey (GBIF Secretariat, 2023). Occur on the mid-intertidal on rocks to depths of 120 m on coarse sediment (Marine Life Database 2020).
Perophora japonica	Creeping sea squirt	Possible	Low/unknown risk	Recorded within Milford Haven (Bishop, 2005). Found on artificial substrata in marinas and harbours and beneath boulders and stones on the low shore in sheltered silty areas (Morrow 2020).
Petricolaria pholadiformis	American piddock	Unlikely	Low/unknown risk	Primarily observed along the south-east English coast (Budd, 2005). Bore into hard clay, chalk, solid mud, peat-moss and limestone from the mid-tide level to low water (Budd 2005).
Polysiphonia harveyi	Red alga	Possible	Low/unknown risk	Observed within Milford Haven and along Pembrokeshire coast (GBIF Secretariat, 2023).
Potamopyrgus antipodarum	New Zealand mud snail	Unlikely	Low/unknown risk	Widespread throughout the UK (GBIF Secretariat, 2023). Largely freshwater but can occur in estuaries and brackish areas (Fofonoff et al., 2018).
Rhithropanopeus harrisii	Crustacean	Unlikely	Low/unknown risk	Very few records from the UK (Fofonoff et al., 2018). Most abundant in estuaries (Fofonoff et al., 2018).

Scientific Name	Common Name	Likelihood of Presence within Study Area	Risk Assessment score (Welsh Government, 2018)	Description
Solieria chordalis	Red alga	Unlikely	Low/unknown risk	Recorded within Milford Haven (GBIF Secretariat 2023). Generally occurs in wave-sheltered habitats growing on rocks, stones, and pebbles (Guiry and Kuipers 2024).
Tricellaria inopinata	Bryozoan	Unlikely	Low/unknown risk	Recorded within Milford Haven (GBIF Secretariat 2023). Found in marinas and harbours on artificial substrata (Morrow 2020).

24. Of these species, the only ones considered to be of medium-high invasive risk that have the potential to occur within the Study Area are the red ripple bryozoan, American jack knife clam, leathery sea squirt, Pacific oyster, and Japanese wireweed. The red ripple bryozoan and Japanese wireweed are considered likely to occur within the Study Area, posing high and medium invasive risks respectively. The American jack knife clam, leathery sea squirt, and Pacific oyster have the potential to occur within the Study Area as their preferred habitats are present, although they have yet to be observed locally. These species are considered to have a medium-moderate risk of invasion.

25. The red ripple bryozoan has been observed throughout Milford Haven and Pembrokeshire waters (Wilson, 2017; Tillin et al., 2020). Previously primarily associated with hard structures in marinas and harbours, it is now frequently recorded on natural coasts along a range of substrates, including bedrock, boulders, debris, shells, kelp and other bryozoans (GB-NNSS 2011) and as such, has the potential to colonise introduced materials associated with the proposed Project.

26. Japanese wireweed is prevalent throughout the UK, including Milford Haven and the Pembrokeshire coast, growing on hard substrates in shallow waters (Pizzolla, 2008). It is most successful in sheltered areas but occurs across a range of exposures. It grows on hard surfaces both intertidally and subtidally, although it can also detach and float freely out at sea (GB-NNSS, 2011). As such, it has the potential to colonise nearshore introduced materials associated with the proposed Project.

27. In addition, recent surveys were conducted within and in the vicinity of the proposed Project to characterise the benthic marine environment in the intertidal and subtidal areas. Project-specific benthic surveys took along the OfECC and comprised drop-down video (DDV) transects and grab sampling in December 2022 and February 2023 to classify the faunal composition and present biotopes (see **Appendix 19A** and **Appendix 19B**). In addition, baseline environmental surveys were carried out for the nearby Project Erebus in 2020 and 2021, whereby the presence of notable taxa were recorded, including INNS. It is important to note that the nearshore area of the OfECC has been revised since the initial benthic surveys, although the data is considered representative of the wider benthic environment near the proposed Project and is applicable to the new route.

28. In the project-specific surveys, no marine INNS were observed. However, surveys for the Project Erebus development reported the presence of the American slipper limpet (*C. fornicata)*, the modest barnacle (*A. modestus)*, the polychaete (*G. gracilis)*, and the leathery sea squirt (*Styela clava*; MarineSpace Ltd, 2022). These species were primarily identified within the Milford Haven Waterway and in nearshore waters. Although the OfECC for the proposed Project will avoid that of project Erebus, the Study Area includes the Erebus cable route and lies approximately 4.5 km from the Erebus landfall. As such these species also have the potential to also be present within the Study Area or establish themselves in the future.

29. The American Slipper limpet is native to the Atlantic coast of North America. It was first recorded in Liverpool, UK, in 1872 and had spread to Wales and the Milford Haven Waterway by 1953 (Bohn, 2014). Locally, it has reached high abundances within the Milford Haven Waterway and is considered common along the south coast of Wales (Bohn, 2014). It is typically found attached to shells and stones in soft sediment habitats around the low water mark and shallow sublittoral, with well-developed populations particularly occurring in sheltered areas such as bays or estuaries (Rayment, 2008). However, this species has been observed as associated with OWF infrastructure (Kerckhof et al., 2015). Of the individuals observed in the Erebus study, occurrences were restricted to nearshore sites within the

Milford Haven Waterway, and as such, it has the potential to spread to the nearshore environment of the OfECC.

30. The modest barnacle is native to Australasia but was first recorded in the UK in 1946 in south-east England (Avant, 2007). Today it is considered one of the most prolific INNS species around the Welsh coastline (Mieszkowska, 2021), occurring widely in estuaries and sheltered coasts (GB-NNSS, 2011). In its invaded range, it has been recorded at various shore heights and as abundant in the mid-low tidal regions, occupying a similar niche to native barnacle species (Gallagher et al., 2015). A recent survey of seven sites in south Wales reported the presence of this species at every site, including an intertidal site within Milford Haven (Mieszkowska, 2021). Within the study area for Erebus, this species was reported at the landfall site in West Angle Bay (MarineSpace Ltd, 2022). As it is most prominent along sheltered coastlines, it is unlikely that this species will be associated with the proposed Project.

31. The leathery sea squirt is native to the northwest Pacific and was first observed in UK waters in 1953 offshore Plymouth (Want and Kakkonen, 2021). In Wales, 169 records have been reported (Sambrook et al., 2014). It largely occurs in shallow waters on hard surfaces and can be abundant in sheltered waters on docks and harbour installations (Neish 2007), but can also occur on natural rocky bottoms, primarily in sheltered and low energy environments (GB-NNSS, 2011). In the Erebus study area, only one individual was observed (MarineSpace Ltd, 2022). As such, it is unlikely that this species will be associated with the proposed Project.

32. The polychaete (*G. gracilis)* was first reported in UK waters in 1970 in Liverpool. It has since been observed in Wales, with 59 observations reported (Sambrook et al., 2014). Within the Erebus study area, only two individuals were observed at a nearshore station within Milford Haven Waterway (MarineSpace Ltd, 2022). Other records of this species in Wales are largely from offshore waters, with a small concentration of observations offshore Swansea (JNCC, 2022). Little is known about this species' preferred habitat, however, the benthic habitat associated with observations is similar to that of the Study Area. It is therefore possible that this species may be associated with the proposed Project, although it is listed as a species of low/unknown invasion risk.

4.5 Risk of INNS Introduction

33. Introduction of artificial structures and transit of vessels pose the risk of marine INNS introduction through the colonisation of hard substrate by locally present marine INNS, and through the spread in extent of INNS which may be present on vessel hulls or in ballast water. These can contribute to an increased rate of spread of these species, acting as 'stepping stones' for introduced species to further establish or expand their range to additional sites (Mineur et al., 2012).

34. As such, vessels and equipment associated with each phase of the proposed Project may be associated with the introduction of marine INNS. To determine the risk of marine INNS introduction, each component has been reviewed for its potential to introduce or spread INNS to the site. The risk of each component has been rated as **high**, **medium**, **low**, or **negligible risk,** and has been adapted from guidance provided by Natural England and NRW (Cook et al., 2015). This assessment is based on publicly available data and literature, as well as professional judgement to complete a site-specific assessment. The risk assessment is provided in **Table 4B-2.**

Table 4B-2. Risk assessment for INNS introduction of vessels and equipment associated with the proposed Project

Component	Location	Type	Details	Risk
Vessels	Entire Study Area	Anticipated vessel types include: Construction Support Vessel: Required for anchor and mooring installations. AHTS Vessel: Necessary for anchor and mooring installations. DP Floating Heavy Lift Vessel: Potentially needed for gravity base anchor installation. Seabed Clearance Vessel: required before installation of offshore export cable. DP Cable Lay Vessel for inter-array and offshore export cable installation; a dive support vessel may be needed for cable pull-in. Rock Placement Vessel. ROV. Crew Transfer Vessels (CTV). Guard Vessels. Survey Vessels.	Vessel size will differ according to phase (e.g. construction, operation and maintenance, decommissioning) and/or task. Some vessels may originate from outside UK waters or from local waters known to host high concentrations of INNS. In this instance, measures for marine INNS risk mitigation will be applied, complying with the IMO Ballast Water Management Convention. Additionally, vessels will be required to adhere to the IMO guidelines for the control and management of ships' biofouling to minimise the transfer of invasive aquatic species (Biofouling Guidelines) (resolution MEPC.207(62). These measures lower the probability of INNS transmission from vessels. Furthermore, project infrastructure (e.g. turbines or platforms) may be constructed elsewhere and towed to the	At this stage, vessel origin is unknown. As such, a worst-case scenario has been assumed to include the use of vessels originating from non-UK waters or waters with known INNS colonisation. Should vessels or project infrastructure originate from the areas with knowingly established populations of marine INNS, the risk of local INNS introduction may be high.

Component	Location	Type	Details	Risk
			array area, which could be associated with an increased risk of marine INNS introduction.	
Substructure	Array Area	Floating barge, semi-submersible, or tension-leg platforms	Up to 10 total structures (one per turbine). Footprint per platform up to 6,500 m^2	Exposed anthropogenic structures provide hard substrate for the settlement of marine INNS, contributing to their dispersal. As such, any exposed substrate associated with the proposed Project has the potential to serve as a surface for colonisation of marine INNS. A study of INNS colonisation associated with OWFs in the Southern North Sea reported the occurrence of several locally established INNS on turbine foundations located 30-50 km offshore, (Kerckhof et al., 2015). As such the risk of marine INNS introduction is considered to be medium.
Anchor System	Array Area	Anchorage likely to comprise a combination of drag embedment and drilled or driven piles.	Drag embedment anchors (maximum 80 anchors): Maximum dimensions 6 x 6.5 x 4 m. Maximum burial depth: 25 m (i.e. fully submerged in seabed). No footprint due to complete burial.	As each anchor option is likely to be buried entirely within the substrate, the risk of marine INNS introduction associated with these structures is considered low.

Component	Location	Type	Details	Risk
			Drilled piles (maximum 80 piles), diameter: up to 3.5 m, penetration depth: up to 52 m Driven piles (maximum 30 piles), diameter: up to 3 m, penetration depth up to 32 m	
Mooring System	Array Area	Mooring systems under consideration include tension leg platform, or catenary spread.	The total length of mooring line will vary by location and mooring type, with each line measuring up to 1,250 m in length. The total number of mooring lines will be up to 80 lines. Lines will be composed of a combination of chain, steel, and synthetic rope.	When considering that the majority of INNS likely to be present within the Study Area are coastal and/or intertidal species, the likelihood of mooring line colonisation by these species is considered low.
Subsea Connector	Array Area	A singular connection box [3] will be located on the seabed from the last turbine connecting to the first.	30 x 12 x 8 m^3 on the seabed	When considering that the majority of INNS likely present within the Study Area are coastal and/or intertidal species, in conjunction with the small dimensions of the connection box, the likelihood of colonisation by INNS is considered low.
Inter-array cables	Array Area	66 kV cables	A maximum of 11 inter-array cables are expected. Cables will have a maximum diameter of 200 mm, with a total length of 17.3 km. Target burial depth is 1.2 m, indicating no exposure to the water column.	As inter-array cabling will be buried within the sediment, no cable area will be exposed to the water column. As such, there is no pathway for introduction of marine INNS associated with this component. The risk of marine INNS introduction has therefore been assessed as negligible.

Component	Location	Type	Details	Risk
Export cable	OfECC	Up to two 132 kV cables	A maximum of two export cables will be used to connect the array area to the onshore substation. The total length of cable on the seabed is expected to be 55 km, with cable diameters of 200 mm. Target burial depth is 1.2 m, indicating no exposure to the water column.	As export cabling will be buried within the sediment, no cable area will be exposed to the water column. As such, there is no pathway for introduction of marine INNS associated with this component. The risk of marine INNS introduction has therefore been appraised as negligible.
Cable protection	OfECC	Cable protection may comprise articulated ducting, grout bags, rock protection, and/or concrete mattresses.	The maximum area of the offshore export cables subject to protection is 48,975 m^2. Additional cable protection is required at crossings with other assets. Six cable crossings have been identified, which will require 200 m of protection at each.	Areas of exposed substrate provide ideal conditions for the settlement of marine INNS. However, studies of artificial substrate placement associated with subsea cables have indicated that colonisation largely occurs by endemic species (OSPAR, 2023). When considering this in conjunction with the fact that most local INNS are coastal/intertidal, the risk of marine INNS introduction has been assessed as low.
Landfall	OfECC	Up to two HDD ducts will traverse the intertidal zone at Freshwater West.	Maximum HDD distance will comprise up to 800 m of offshore drilling, with a duct diameter of 660 mm. Rock protection is expected to be associated with each HDD exit point (one per cable), comprising 250 m^2.	Areas of exposed substrate can provide ideal conditions for the settlement of marine INNS. Furthermore, of the marine INNS species known to occur within the Study Area, many are nearshore or intertidal species. Given the surface area of expected cable protection, the risk of marine INNS introduction has been assessed as medium.

4.6 Pathways for INNS Introduction

35. To understand the pathways present for INNS introduction, a close examination of the main proposed Project activities is essential, as each activity presents varying degrees of risk for introducing marine INNS. For example, proposed Project vessels travelling from international ports are likely to carry an increased risk of marine INNS introduction comparative to vessels originating from local ports.

36. A list of activities associated with each phase of the proposed Project (Construction, Operational, and Decommissioning) that is considered to carry a significant risk of marine INNS introduction is provided in **Table 4B-3.** These have been collated with consideration given to marine INNS anticipated to be present in the Study Area (**Section 4.4.2**) and equipment and vessels to likely be associated with the proposed Project (**Section 4.5**).

Table 4B-3. Activities associated with project activities with the potential to introduce marine INNS

Project Phase	Activity	Pathway
Construction	• Turbine and platform installation • Cable & HDD protection	Introduction of anthropogenic structures
	• Use of vessels originating from outside the local area or from areas with known INNS populations	Presence of INNS in any released ballast water or on vessel hull
Operational	• Maintenance of platforms, ancillary equipment, and cables	Long-term presence of anthropogenic structures
	• Disposal of biofouling	Release of biofouling into water column
	• Use of vessels originating from outside the local area	Presence of INNS in any released ballast water or on vessel hull
Decommissioning	• Removal of platforms, ancillary equipment, and cables	Release of biofouling into water column

4.7 Biosecurity Control Measures

37. Biosecurity control measures are essential for preventing and/or mitigating the spread of INNS during proposed Project activities (Cook et al., 2015). For these methods to be effective, they must be clear, realistic, and easy to communicate (Cook et al., 2015). It is important that consideration is given to who is responsible for relevant actions, what measures will reduce the risk of introducing marine INNS, and where and when these control measures will be applied (Cook et al., 2015).

38. Guidance produced by Natural England and NRW on marine biosecurity planning recommend a ranking system to help prioritise biodiversity risks during visual inspections of equipment or vessels, with Rank 3 or above recommended to be carried forward for biosecurity measures (Error! Reference source not found.**Table 4B-4**; Cook et al., 2015). Where significant risks are identified, it is essential that the surfaces are mechanically cleaned or chemically treated to remove all potential marine INNS, with fouling disposed of in line with relevant guidelines to prevent further spread of these organisms to the local environment.

Table 4B-4. Biosecurity risk ranking for visual inspections of project equipment and materials source: Cook et al., 2015

Rank	Description	Visual Estimate of Biofouling Cover
0	No visible fouling	0%
1	Surfaces partially or fully covered in biofilm[1], but absence of any plants or animals	0%
2	Light fouling; surface fully covered in biofilm; 1-2 small patches of one type of animal or plant are present	1% of visual submerged surfaces
3	Considerable fouling; presence of biofilm; fouling still patchy but visible with one or more type of plant or animal	6-15% of visual submerged surfaces
4	Extensive fouling; presence of biofilm; abundant fouling assemblages consisting of more than one type of plant or animal	16-40% of visual submerged surfaces
5	Very heavy fouling; fouling assemblage comprising many different types of plants and/or animals	41-100% of visual submerged surfaces

39. Additionally, the GB Non-Native Species Secretariat and RAPID LIFE project have outlined important biosecurity control measures for reducing the spread of INNS in the marine environment (RAPID LIFE, 2020a). Based on the pathways described in **Section 4.6**, relevant biosecurity measures are provided in **Table 4B-5.** It is important to note that the understanding of INNS, activities that contribute to their dispersal, and preventative technologies is continually under development. As such, measures to prevent the spread of INNS are likely to adapt over time. Therefore, the measures recommended in this document should be subject to periodic review against publicly available data and scientific literature to ensure control measure are up to date.

[1] Biofilm is a thin layer of bacteria, algae, detritus, and/or other particulates

Table 4B-5. Biosecurity control measures for the proposed Project

Project Phase	Pathway	Associated Risk	Biosecurity Measure
Construction	Installation of proposed Project marine infrastructure (e.g. turbines, platforms, cable protection, etc.)	Introduction of proposed Project marine infrastructure pose the risk of marine INNS introduction through the colonisation of hard substrate by locally present marine INNS. This can contribute to an increased rate of spread of these species or act as 'stepping stones' for introduced species to further establish or expand their range to additional sites (Mineur et al., 2012).	Where practicable, all proposed Project marine infrastructure introduced into the marine environment will have the appropriate anti-fouling coatings.
			Where elements cannot receive an anti-fouling coating, they will be appropriately visually inspected, thoroughly cleaned, and dried out prior to placement within the marine environment.
	Use of vessels originating from outside UK waters	Vessels serve as one of the primary vectors for the spread of INNS around the world. Vessels originating from other areas can carry INNS in their ballast water or attached to the hull. This can result in the introduction of INNS to the proposed Project area or contribute to the spread of existing INNS.	All proposed Project vessels shall adhere to the International Convention for the Control and Management of Ships' Ballast Water and Sediments with the aim of preventing the spread of marine INNS (IMO, 2017) and the International Maritime Organisation (IMO) Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (Biofouling Guidelines) (IMO, 2011).
Operation	Cable maintenance and repair	Maintenance and cable repair activities during instances of cable failure, excavation and disturbance from movement of catenary chains, where required, will be carried out using the same or similar methods as the Construction Phase activities, and therefore the potential pathways for introduction of marine INNS are expected to be the same as those identified for the Construction Phase of the proposed Project.	Same as Construction phase
Decommissioning	Decommissioning	At the end of the operational life of the proposed Project, the options for decommissioning will be evaluated. Other proposed Project constraints will also be	It is anticipated that all buried infrastructure will be left in situ, whilst all other infrastructure is removed. However, a Decommissioning Plan will be

Project Phase	Pathway	Associated Risk	Biosecurity Measure
		taken into consideration (e.g. safety and liability), with the least environmentally damaging option chosen if possible.	prepared during the Operational phase and will be consulted on for both offshore and onshore infrastructure before being submitted for approval to NRW MLT. Assumption would be that the extent, duration and scale of impact for decommissioning will be the same or less than that of the Construction and Operational phases

4.8 Surveillance, Monitoring, and Reporting

40. Early detection of marine INNS is key, as it will increase the likelihood of successful containment and eradication (Cook et al. 2015). An essential first step in this process is prevention, which can be implemented though visual monitoring of all equipment, materials, and vessels involved in proposed Project activities for the presence of any potential marine INNS.

41. Relevant staff should be trained in common marine INNS identification and encouraged to report suspicious plant or animal species. If deemed necessary, immediate action should be taken to remove fouling communities and control the spread of present marine INNS. Operations managers should oversee checks regarding marine INNS presence and any cleaning/biofouling disposal. When considering the recommended biosecurity measures and embedded mitigation, it is unlikely that the proposed Project will contribute to the introduction and spread of INNS.

42. **Table 4B-6** outlines proposed biosecurity responsibilities for personnel operating in the Study Area.

Table 4B-6. Biosecurity and monitoring responsibilities for personnel

Personnel	Task	Location	Project Phase
Operations manager	Oversee installation of equipment, checking for marine INNS, and assurance of any biofouling disposal in line with relevant guidelines (e.g. IMO, 2011) Liaise with local authorities (e.g. NRW) regarding marine INNS awareness and management	Port	Construction phase
Developers and/or contractors	Confirm lack of marine INNS on equipment and materials and application of any anti-fouling measures	Port	Construction phase

Personnel	Task	Location	Project Phase
Developers and/or Contractors	Regular monitor of installation for presence of marine INNS	Array Area	Operation and Maintenance Phase
Operations Manager	Consultation with regulators to develop and adapt project-specific measures as proposed Project progresses throughout lifecycle	N/A	Construction, Operation and Maintenance, Decommissioning
All	Awareness of common marine INNS and ability to report any observations	N/A	Construction, Operation and Maintenance, Decommissioning

4.9 Contingency Plan

43. Even with the most effective preventative and containment measures in place, introduction of marine INNS can still occur. Additionally, introduction may occur as a result of external activities or processes. This section outlines the appropriate measures which should be taken if biosecurity measures fail to prevent the introduction of marine INNS to the Study Area, as recommended by the Non-Native Species Secretariat and RAPID LIFE project. A flow diagram of relevant steps and associated responsibilities is provided in **Figure 4B-2.**

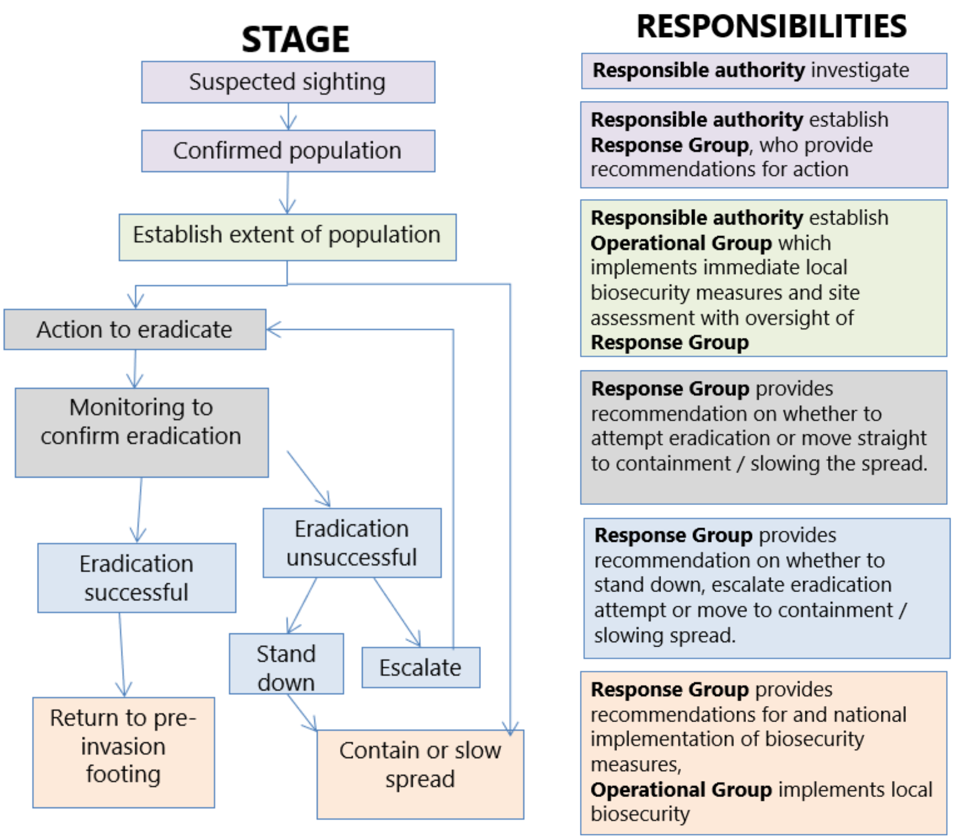

Figure 4B-2. Flow diagram of contingency plan steps and related responsibilities source: RAPID LIFE, 2020b

44. Should marine INNS be reported within the Study Area, the following steps should be taken (Cook et al., 2015):

1. **Determine the extent –** conduct a survey to determine the extent and distribution of marine INNS on project infrastructure;
2. **Inform relevant authorities –** contact authorities such as NRW and/or the Non-Native Species Secretariat to report the observation and obtain guidance on whether action is required;
3. **Action to eradicate –** should the identified species be deemed a high risk and necessary to eradicate, a Response Group will be formed led by the Responsible Authority which will act as advisors, guiding operators (Operational Group) and liaising between senior officials and ministers as necessary. The Operational Group will be responsible for the following (RAPID LIFE, 2020b):
   - Assess the affected area for the extent of the population of the marine INNS;
   - Initiate the immediate implementation of biosecurity measures, as advised by the response group;
   - Undertake a biosecurity risk assessment of pathways in and out of the affected area;
   - Informed by the surveys, provide advice on management (eradication or containment), which will include any site-specific issues;
   - Undertake surveillance of other water bodies that may be affected, dependent on risk analysis;
   - Liaise with land owners and interested parties, to secure access and gather site-specific information;
   - Implement additional biosecurity measures where appropriate; and
   - Identify and investigate outbreak source, to prevent further contamination, pursue appropriate legal action etc.
4. **Monitor –** should eradication successfully occur; long-term monitoring is essential to ensure the reintroduction does not occur.

4.10 Conclusion

45. It is a requirement of NRW that applications for Band 3 marine licences are accompanied by detailed biosecurity risk assessments prior to any offshore works (**Section 4.7**). This document forms part of an initial assessment of biosecurity risks associated with the proposed Project and outlines relevant biosecurity measures that could be implemented to prevent and/or control the spread of any INNS throughout the lifecycle of the proposed Project.

46. Activities associated with the proposed Project pose the risk of marine INNS introduction and spread in the marine environment. The primary pathways for introduction from activities associated with the proposed Project include the vessels movement (which may carry marine INNS in ballast water or attached to the hull), and the introduction of anthropogenic structures into the marine environment, which may serve as substrate for colonisation.

47. A number of moderate to high-risk marine INNS are known to occur within the Study Area. Whilst no INNS were observed during proposed Project surveys, surveys for the adjacent Erebus project reported the American slipper limpet, the modest barnacle, the leathery sea squirt, and the polychaete (*G. gracilis).* As activities associated with the proposed Project may

contribute to the spread of these individuals locally, it is important that the appropriate biosecurity measures are enacted to reduce the risk of introduction and minimise further spreading.

48. It is recommended that annual monitoring of the Offshore Development Area occur to monitor for the occurrence of marine INNS. Should any marine INNS be observed, relevant regulators (e.g. NRW) must be informed, who will guide the operator in the next best steps to take to eradicate and/or contain the species present. Where no marine INNS are observed in initial monitoring, frequency can gradually reduce over time.

4.11 References

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